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REMARKS

Applicants have carefully considered the points raised in the Office Action and believe that the Examiner's concerns have been addressed, as described herein, thereby placing this case into condition for allowance.

Status of the claims

Claims 1-65 were pending. Claims 19-39 and 49-65 were previously withdrawn as drawn to a non-elected invention. Claims 1-12, 14, 15 and 40-47 have been rejected. Claims 13, 16-18, 48 have been objected to. By virtue of this response, claims 2, 19-39, 41, and 49-65 have been cancelled, and new claims 66-70 have been added. Claims 1, 3-18, 40, 42-48, and 66-70 are currently under consideration. The claim amendments and new claims are supported by the specification. Support for new claims 67-70 may be found, for example, in paragraphs [0120] – [0122]. No new matter has been added by the foregoing amendments.

With respect to any claim amendments or cancellations, Applicants have not dedicated to the public or abandoned any unclaimed subject matter and moreover have not acquiesced to any rejections and/or objections made by the Patent Office. Applicants expressly reserve the right to pursue prosecution of any presently excluded subject matter or claim embodiments in one or more future continuation and/or divisional application(s).

Telephone Interview

Applicants would like to thank Examiner Tran for extending the courtesy of a telephone interview on December 15, 2005, and for the helpful discussion that ensued with regard to the pending claims and the cited reference.

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Rejection under 35 U.S.C. §112, second paragraph

Claim 45 is rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite due to recitation of the phrase "lean zones do not comprise fuel." Applicants respectfully traverse this rejection.

As described in the specification and as discussed during the telephone interview, in methods and devices of the invention, fuel is injected into an oxygen containing gas stream to create rich and lean zones in the gas stream. A rich zone is produced when an amount of fuel is injected such that the fuel air equivalence ratio (ratio between the actual amount of fuel added and the amount that would be required to fully react with all of the oxygen present in a gas mixture) is greater than 1, and a lean zone is produced either when no fuel is added to the gas stream or when fuel is added in an amount such that the fuel air equivalence ratio is less than 1.0. (See, e.g., paragraph [0057].) Claim 45 describes an embodiment in which a lean zone is produced in the gas stream by not injecting fuel into that portion of the gas stream, and thus the lean zone does not comprise fuel. Applicants respectfully submit that this claim is clear as written.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §112, second paragraph.

Response to Election/Restriction

The Office Action states that Applicants' election without traverse of the invention of Group I is acknowledged, and that "[a] complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP 821.01." Applicants respectfully note that MPEP §821.01 states that "[w]hen preparing a final action in an application where there has been a traversal of a requirement for restriction, the examiner should indicate in the Office action that a complete reply must include cancellation of the claims drawn to the nonelected invention, or other appropriate action (37 CFR 1.144)." (Emphasis added.) Neither

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of the conditions set forth in this section of the MPEP (Final Office Action or previous traversal of a restriction requirement) are present in the instant case, in which a *nonfinal* Office Action is pending and a previous election in response to a restriction requirement was made *without* traverse. Therefore, the requirement to cancel the nonelected claims is moot. However, in the interest of expediting prosecution, claims 19-39 and 49-65 have been canceled by virtue of this response.

Rejection under 35 U.S.C. §102(b)

Claims 1-12, 14-15, and 40-47 are rejected under 35 U.S.C. §102(b) as allegedly anticipated by Balko et al. (U.S. Patent No. 6,176,078). Applicants respectfully traverse this rejection.

The claimed invention includes injecting fuel into an oxygen containing gas stream to produce rich and lean zones in an oxygen containing gas stream. The injected fuel flows through a catalytic zone which contains both an oxidation catalyst and a reforming catalyst. A portion of the injected fuel in a rich zone of the gas stream is oxidized on the oxidation catalyst and at least a portion of the remaining fuel in the rich zone is reformed on the reforming catalyst, thereby producing a reducing gas.

In contrast, Balko et al. teach a device in which fuel is added to a gas stream which is then passed over a cracking catalyst to produce short chain organic molecules and further passed over a downstream oxidation catalyst to produce aldehydes and ketones. In Applicants' claimed device a portion of fuel in a rich zone of the gas stream is oxidized on an oxidation catalyst, and at least a portion of the *remaining fuel* in the rich zone is reformed on a reforming catalyst. In the device taught by Balko et al. the oxidation catalyst is downstream from the cracking catalyst, so it is not possible for fuel in the gas stream to be oxidized, accompanied by reforming of *remaining* fuel in the gas stream, as claimed by Applicants.

Further, Balko et al. do not disclose production of *rich and lean zones* in a gas stream. Balko et al. describe a device in which fuel is added to a gas stream flowing over a cracking catalyst to produce a rich mixture, but there is no disclosure of production of rich and lean zones in the

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flowing gas stream. In the system described by Balko et al., the gas mixture is always rich. Otherwise, the oxidation catalyst 22 (referred to by Balko et al. as a "partial oxidation catalyst" (col. 14, line 44)) would not produce the products described, *e.g.*, aldehydes and ketones (col. 8, line 19), olefins and oxygenates (col. 8, line 58). Air is added to the gas mixture prior to the oxidation catalyst, but the products that are produced, *e.g.*, aldehydes and ketones, are partial oxidation products, which indicates that the gas mixture at this position in the device is not lean. If the gas mixture were lean, these reactive hydrocarbons would be oxidized to CO₂ and H₂O. A lean gas mixture flowing over an oxidation catalyst would produce complete oxidation products rather than partial oxidation products.

Balko et al. also do not disclose elements of dependent claims in the present application. For example, in contrast to the statement in the Office Action that the reducing gas stream produced in the device of Balko et al. comprises H₂ and CO, Balko et al. disclose production of aldehydes and ketones as reductants, and there is no disclosure in this patent of a reducing gas comprising H₂ and CO. In contrast to the statement in the Office Action that Balko et al. disclose that the fuel injector is adapted to introduce a hydrocarbon fuel to an oxygen containing gas stream discontinuously to form alternating rich and lean zones, Applicants respectfully submit that there is no disclosure of discontinuous fuel injection in this reference, and there is no disclosure of formation of alternating rich and lean zones in the gas stream. Further, in contrast to the statement in the Office Action that Balko et al. disclose that the fuel injector is adapted to introduce a hydrocarbon fuel to a portion of an oxygen containing gas stream essentially continuously to form a rich zone, and the device is configured such that the portion of the catalytic zone through which the rich zone flows varies over time, Applicants respectfully submit that there is no disclosure of a device in which the portion of the catalyst structure through which a rich mixture flows is varied over time.

This reference and the arguments herein were discussed during the recent telephone interview, and the Examiner agreed that this reference does not anticipate the claimed invention.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §102(b).

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Allowable Subject Matter

Applicants acknowledge with appreciation the indication in the Office Action that claims 13, 16-18, and 48 are objected to as being dependent upon a rejected base claim, but otherwise contain allowable subject matter.

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CONCLUSION

Applicants have, by way of the amendments and remarks presented herein, removed the issues for the rejections and addressed all issues that were raised in the outstanding Office Action. Accordingly, reconsideration and allowance of the pending claims are respectfully requested. If it is determined that a telephone conversation would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 220772010800. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

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